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EXAMINER

LEADER, WILLIAM T

ART UNIT

PAPER NUMBER

1742

3

DATE MAILED: 06/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/944,562

**Applicant(s)**

SARTEN ET AL.

**Examiner**

William T. Leader

**Art Unit**

1742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. The preamble of independent claim 1 recites a method of removing technetium from a contaminated metal. However, none of the process steps recite providing a metal contaminated with technetium or removing the technetium. Claim 1 recites the step of providing a disc-shaped metal wafer but does not indicate that this wafer is the metal contaminated with technetium. Claim 1 also recites the step of dissolving the anode and depositing metal dissolved upon the cathode. As written, all of the metal(s) dissolved from the anode would be expected to deposit on the cathode. No step or manner of separation of desired metal from technetium has been recited. Independent claims 10 and 17 are similar.

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 1-20 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for removing technetium from nickel, does not reasonably provide enablement for removing technetium from other metals. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to practice the invention commensurate in scope with these claims. At page 3, under the heading "Summary Of The Invention", applicant states that "A decontamination method and system is described wherein contaminated nickel anodes are obtained by cutting cylindrical nickel ingots into wafers having disc shape." At page 4, applicant discloses use of a Watts nickel electrolyte, and explains that a cationic membrane between the anode and cathode keeps the technetium from the dissolving anode from passing from the anolyte into the cathode while a portion of the nickel ions from the dissolving anode do pass through the cationic membrane and are plated out on the cathode. Applicant has provided no guidance as to how the separate technetium from metals other than nickel.

6. Additionally, while being enabling for removing technetium from nickel by electrorefining using a cationic membrane separating the cathode from the anode, the specification does not reasonably provide enablement for other methods of removing technetium. At page 3, under the heading "Summary Of The Invention", applicant states that "A cationic membrane assembly separates the cathode from

the anode” and explains that “The cationic membrane between the anode and cathode keeps the technetium from passing from the anolyte into the catholyte. In this manner, the catholyte, and therefore the cathode, remains contaminant free.” No other method for preventing technetium from depositing with the nickel to be recovered on the cathode has been disclosed.

*Claim Rejections - 35 USC § 103*

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 1-13 and 16-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hradil (5,458,745) in view of the paper Advanced Technologies for Decontamination and Conversion of Scrap Metal by MacNair et al, and either of Suarez (4,150,247) or Frehser et al (3,930,531).

10. The Hradil patent is directed to a process for the decontamination of high purity nickel containing technetium 99 (column 1, lines 5-8). As shown in figure 1, an electrochemical cell is provided. The cell is divided into a cathode compartment 3 with a cathode and catholyte solution, and anode compartment 2 with an anode and anolyte solution by membrane 6. The membrane may be a cationic, ion-selective membrane (column 2, lines 38-39). Contaminated nickel is provided in the form of a relatively thin block of metal and connected as the anode in the anode compartment. In operation, a voltage is applied between the anode and cathode. Nickel and technetium dissolve from the anode into an electrolyte maintained at a pH of 1-4 (column 4, lines 59-60). In this acidic solution, technetium exists predominantly in a heptavalent form, as pertechnetate ions ( $\text{TcO}_4^-$ ) and nickel exists as  $\text{Ni}^{++}$  (column 2, line 66 to column 3, line 1). The cationic membrane allows positively charged nickel ions to pass from the anolyte to the catholyte, while preventing the passage of the negatively charged pertechnetate ions, thereby keeping the catholyte and cathodic nickel deposit substantially free of technetium (column 6, lines 26-30).

11. The process of claim 1 differs from that of Hradil by reciting that the anode is in the form of a disc-shaped wafer. Independent claim 10 differs by reciting cutting an ingot to provide one or more disc-shaped wafers, while claim 17 recites providing nickel in the form of a substantially cylindrical ingot and cutting at least one disc-shaped wafer. The MacNair et al report discloses the use of an electrorefining cell to remove technetium from contaminated nickel by dissolving the nickel and technetium from the anode, passing the nickel through a Nafion™ cationic membrane, and depositing it on the cathode. The contaminated nickel was provided in the form of an ingot. The ingot was sliced to provide anode material which was mounted to a hanger and placed directly into the electrorefining cell. See page 28, section 3.1.10 and page 16, section 3.0.7. MacNair et al do not disclose that the ingot was cylindrical in shape. However, both Suarez and Frehser et al show that cylindrical-shaped ingots are well-known. Suarez states that figure 1 shows a conventional top-pour ingot casting (column 1, lines 62-63). Figure 1 clearly shows a cylindrical ingot. Frehser et al disclose a method for manufacturing a round ingot with a diameter of 400 mm (column 3, lines 66-67).

12. The prior art of record is indicative of the level of skill of one of ordinary skill in the art. It would have been obvious at the time the invention was made to have utilized a disc-shaped slice from an ingot of contaminated nickel as the anode in the process of Hradil because MacNair shows that a slice cut from an ingot forms an

anode of a useful size that may be suspended directly in the electrorefining cell, and to have utilized an ingot of a cylindrical configuration because such a configuration is conventional as shown by Suarez and Frehser et al.

13. The limitations of instant claims 2-4, 9, 11, 13, 16 and 20 have been addressed above in describing the references. Claims 5, 8, 12 and 19 recite the use of a technetium trap outside of the electrorefining cell, while claim 6 recites use of a fluid pump and claim 7 recites the use of a particulate filter. Figure 1 of Hradil shows that anolyte is passed through line 8 and pump 9 to filter 11 where particulates are removed (column 4, line 67 to column 5, line 2). This disclosure meets the limitations of claims 6 and 7. The filtered anolyte passes to vessel 13 which contains a metal, such as nickel, in a high surface area form. Due to the difference in standard electrode potential, an electrochemical cell is formed and the pertechnetate ions are reduced by the nickel, which may be regarded as a cathode. See column 2, line 64 to column 3, line 66. Since the technetium in the solution is deposited in vessel 13 it functions as a technetium trap as recited in claims 5, 8, 12 and 19. Anolyte from which the pertechnetate ions have been removed is recycled to the electrorefining cell. Instant claim 18 recites cooling the ingot from the outer surface inwardly. As noted above, Suarez refers to conventional top-pour ingot casting. As the metal is cast into a mold, it would be expected to cool adjacent the



surface of the mold first, in the same manner described at page 9 of the specification.

14. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hradil (5,458,745) in view of the paper Advanced Technologies for Decontamination and Conversion of Scrap Metal by MacNair et al, and either of Suarez (4,150,247) or Frehser et al (3,930,531) as applied to claims 1-13 and 16-20 above, and further in view of Kunter et al (4,587,163).

15. Claim 14 recites that the cathode comprises a rectangular plate. Hradil shows a cathodic plate 5, but does not disclose its shape. The Kunter et al patent is directed to the recovery of gold. As shown in figure 6, a solution containing gold is directed to electrolytic cell 131 where the gold is plated onto the cathodes. The cathode may be either rectangular or cylindrical in shape (column 8, lines 10-13). It would have been obvious to have utilized a cathode of rectangular shape in the process of Hradil because cathodes of his shape are known to be useful in recovering a metal as shown by Kunter et al.

16. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hradil (5,458,745) in view of the paper Advanced Technologies for Decontamination and Conversion of Scrap Metal by MacNair et al, and either of Suarez (4,150,247) or

Frehser et al (3,930,531) as applied to claims 1-13 and 16-20 above, and further in view of Benning et al (2,550,445).

17. Claim 15 recites that the anode is secured to the supporting header by welding. As noted above, MacNair et al disclose mounting the slice of ingot to a hanger for use as the anode, but do not indicate how the slice was attached to the hanger. The Benning et al patent is directed to an electrolytic cell with a welded anode assembly. Anode plates 17 are attached to the supporting bar 16 by welding (column 4, lines 21-27). It would have been obvious at the time the invention was made to have welded the ingot slice of MacNair to the hanger because welding is a recognized method for attaching an anode to its support assembly as shown by Benning et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to William T. Leader whose telephone number is 703-308-2530. The examiner can normally be reached on Mondays-Thursdays and alternate Fridays, 7:30-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King, can be reached on 703-308-1146. The fax phone numbers for the organization where this application or proceeding is assigned are


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703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

WL

William Leader  
June 3, 2003

ROY KING   
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